

Application No. 10/663,481
Amendment dated January 20, 2006
Reply to Office Action of December 29, 2006

Docket No. 1232-4540US1

Amendments to the Claims:

Claims 1-14 and 35-42 are pending in this application. Claims 1 and 35 are independent.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 (CURRENTLY AMENDED): An image reading apparatus for irradiating an original image with a light source and forming an image corresponding to the original image on an image sensing device through an imaging optical system to read the original image, comprising:

control means for shifting an ON start timing of the light source for illuminating the original image from a start timing of a predetermined charge storage period of the image sensing device,

wherein said control means controls a phase of a control pulse for driving the light source so as to shift the ON start timing of the light source.

2 (CANCELLED): The apparatus according to claim 1, wherein said control means controls a phase of a control pulse for driving the light source so as to shift the ON start timing of the light source.

3 (CURRENTLY AMENDED): The apparatus according to claim [[2]] 1, wherein said control means generates the control pulse symmetrically with respect to a predetermined reference timing in the charge storage period along a time axis.

4 (ORIGINAL): The apparatus according to claim 3, wherein said control means uses the reference timing as a central position of the charge storage period along the time axis.

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5 (ORIGINAL): The apparatus according to claim 3, wherein said control means uses the reference timing as a start timing or an end timing of the charge storage period.

6 (ORIGINAL): The apparatus according to claim 3, wherein said control means determines a start timing or an end timing of the control pulse in accordance with a duty ratio of the control pulse, that is determined by pulse-width modulation in accordance with the charge storage period and a magnitude of an output signal from the image sensing device, so as to generate the control pulse substantially symmetrically with respect to the reference timing along the time axis.

7 (CURRENTLY AMENDED): ~~The apparatus according to claim 1;~~ An image reading apparatus for irradiating an original image with a light source and forming an image corresponding to the original image on an image sensing device through an imaging optical system to read the original image, comprising:

control means for shifting an ON start timing of the light source for illuminating the original image from a start timing of a predetermined charge storage period of the image sensing device,

wherein the light source contains a plurality of color components which have afterglow characteristics different from each other.

8 (ORIGINAL): The apparatus according to claim 7, wherein said control means causes the light source to emit the plurality of color components in accordance with the same control pulse.

9 (CANCELLED):

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10 (ORIGINAL): The apparatus according to claim 1, wherein the light source comprises a fluorescent lamp.

11 (ORIGINAL): The apparatus according to claim 10, wherein a plurality of phosphors applied to an inner wall of a tube of the fluorescent lamp have afterglow characteristics different from each other.

12 (ORIGINAL): The apparatus according to claim 1, wherein the image sensing device comprises a plurality of line sensors for reading images of different color components.

13 (ORIGINAL): The apparatus according to claim 1, wherein said control means controls a duty ratio of a control pulse by pulse-width modulation.

14 (ORIGINAL): The apparatus according to claim 13, further comprising a memory storing relationships between phases and duty ratios of the control pulse, and wherein said control means, in controlling the phase of the control pulse for driving the light source, adjusts the phase of the control pulse with reference to said memory in accordance with the duty ratio of the control pulse, which is determined by pulse-width modulation.

15-34 (CANCELLED):

35 (CURRENTLY AMENDED): A dimming control method for a light source in an image reading apparatus for irradiating an original image with the light source and forming an image corresponding to the original image on an image sensing device through an imaging optical system to read the original image, comprising:

a control step of shifting an ON start timing of the light source for illuminating

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the original image from a start timing of a predetermined charge storage period of the image sensing device;

wherein, in the control step, a phase of a control pulse for driving the light source is controlled so as to shift the ON start timing of the light source.

36 (CANCELLED):

37 (CURRENTLY AMENDED): The method according to claim [[36]] 35, wherein, in the control step, the control pulse is generated symmetrically with respect to a predetermined reference timing in the charge storage period along a time axis.

38 (ORIGINAL): The method according to claim 37, wherein, in the control step, the reference timing is set at a central position of the charge storage period along the time axis.

39 (ORIGINAL): The method according to claim 37, wherein, in the control step, the reference timing is set at a start timing or an end timing of the charge storage period.

40 (ORIGINAL): The method according to claim 37, wherein, in the control step, a start timing or an end timing of the control pulse is determined in accordance with a duty ratio of the control pulse, that is determined by pulse-width modulation in accordance with the charge storage period and a magnitude of an output signal from the image sensing device, so as to generate the control pulse substantially symmetrically with respect to the reference timing along the time axis.

41 (ORIGINAL): The method according to claim 35, wherein the light source contains a plurality of color components, and in the control step, the light source to emit the plurality of

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color components is emitted in accordance with the same control pulse.

42 (ORIGINAL): The method according to claim 35, wherein, in the control step, a duty ratio of a control pulse is controlled by pulse-width modulation.

43-53 (CANCELLED):